Presentation for the Symposium on BEER *November 2020*

Interventions on Chlamydia and Trichomoniasis Epidemiological Models Based on a Donovanosis Eradication Plan

Frances Aponte-Caraballo[1,*], Aixamar Cosme-Román[2], Mayteé Cruz-Aponte[3]

[1]*Department of Biology, University of Puerto Rico, Cayey, PR 00736*
[2]*Department of Natural Sciences, University of Puerto Rico, Cayey, PR 00736*
[3]*Department of Mathematics University of Puerto Rico, Cayey, PR 00736*

frances.aponte2@upr.edu

Sexually transmitted diseases (STDs) can turn into epidemics depending on human behavior, such is the case of the Puerto Rican population between15-35 years old of heterosexual males and females with Chlamydia and Trichomoniasis. We aimed to apply a quarantine (Isolation type) intervention to Chlamydia and Trichomoniasis to see if the epidemic could be eradicated or diminished. The goal is to accomplish what the Australian Government did with the Donovanosis epidemic, which helped them eradicate it and, at the same time, control HIV cases that were their primary goal. If we applied this intervention to the epidemiological models of these two diseases, we could reduce the basic reproductive number (R0). After establishing a model for each STD, the differential equations from them and applying the second operator generator, we obtain the R0 of Chlamydia and Trichomoniasis. In effect, the R0 of Chlamydia decreases a 57.28% for women and 52.73% for men and for Trichomoniasis it decreases a 14.04% for the population. The R0 decreases significantly, but quarantine was not enough to eradicate the diseases, partly because the asymptomatic individuals that are not yet diagnosed continue spreading the infections. However, we want to run some simulations and additional interventions to the parameters to see which interventions besides quarantine can be applied to eradicate or control even more the Chlamydia and Trichomoniasis epidemic in Puerto Rico.